



APA 关联部件功能说明

TTE E21

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APA 关联部件

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Revision history

Version	Version Description	Responsible	Date
V1.0	First draft	WangXiong	2015-04-27
V1.1	1、3.1.2 中增加《TTE APA 系统对轮速脉冲信号的性能要求》 2、3.6 半自动泊车显示提示第 43 项文字修改	WangXiong	2015-09-22

Change log


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1 引言

1.1 目的/范围

本文描述了 TTE APA 关联系统的内容。

1.2 参考文档


表格中的内容是与该系统相关的一些参考文档。

Table 1.2.1: 参考文档

Reference Num	Source	Title	Version or date	Document Number

1.3 缩写

表格中内容是本文中用到的缩写词。

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Table 1.3.1: 缩写

Acronyms	Description
APA	Auto Parking Assistance System

1.4 定义

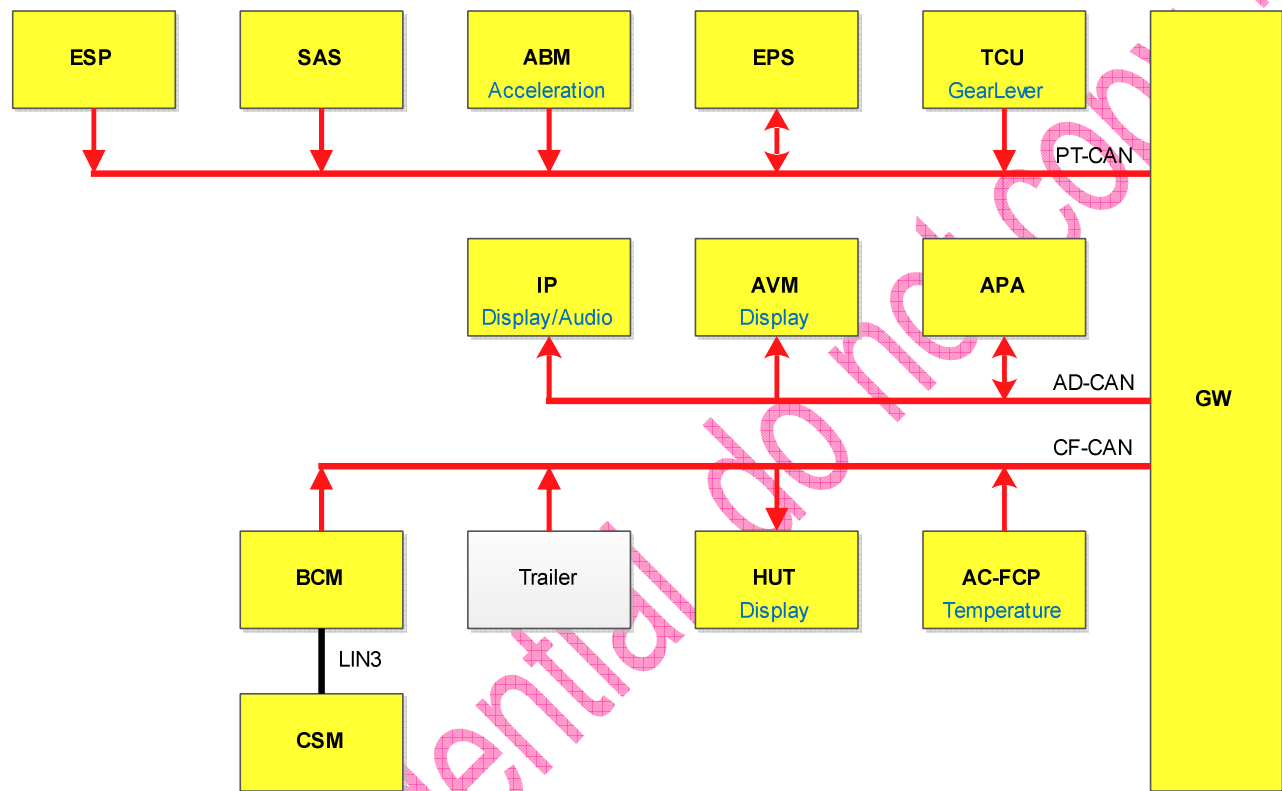
Table 1.4.1: 系统定义

Term	Definition

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2 系统分析

2.1 关联部件网络拓扑图



2.2 信号列表范例


2041-001-013MM02
C_Matrix for AD-C

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3 各部件分析

3.1 ESP

APA 接收 ESP 发出的轮速信号、轮速方向信号、轮速脉冲信号、车速信号。

3.1.1 APA 接收 ESP 发出的轮速信号

No.	Signal Name	Signal Description	Size	Note
1	FLWheelSpdValid	Front left wheel speed valid	1	
2	FLWheelSpd	Front left wheel speed	13	
3	FRWheelSpdValid	Front right wheel speed valid	1	
4	FRWheelSpd	Front right wheel speed	13	
5	RLWheelSpdValid	Rear left wheel speed valid	1	
6	RLWheelSpd	Rear left wheel speed	13	
7	RRWheelSpdValid	Rear right wheel speed valid	1	
8	RRWheelSpd	Rear right wheel speed	13	


3.1.2 APA 接收 ESP 发出的轮速脉冲信号

要求：车轮每转动一圈的脉冲数大于 96 个, 在低速行驶或点刹情况下不允许出现轮速脉冲丢失。



TTE APA
系统对轮速脉冲信号

No.	Signal Name	Signal Description	Size	Note
1	WssFLEdgesSum	Sum of edge of Front Left Wheel speed sensor	8	
2	WssFREdgesSum	Sum of edge of Front Right Wheel speed sensor	8	
3	WssRREdgesSum	Sum of edge of rear Right Wheel speed sensor	8	
4	WssRLEdgesSum	Sum of edge of rear Left Wheel speed sensor	8	
5	WssFLEdgesSumvalid	Valid signal for Sum of edge of Front Left Wheel speed sensor	1	
6	WssFREdgesSumvalid	Valid signal for Sum of edge of Front Right Wheel speed sensor	1	
7	WssRLEdgesSumvalid	Valid signal for Sum of edge of rear Left Wheel speed sensor	1	
8	WssRREdgesSumvalid	Valid signal for Sum of edge of rear Right Wheel speed sensor	1	

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3.1.3 APA 接收 ESP 发出的轮速方向信号

No.	Signal Name	Signal Description	Size	Note
1	FLWheelDriveDirection	Front left wheel Moving direction	2	
2	FRWheelDriveDirection	Front right wheel Moving direction	2	
3	RLWheelDriveDirection	Rear left wheel Moving direction	2	
4	RRWheelDriveDirection	Rear right wheel Moving direction	2	

3.1.4 APA 接收 ESP 发出的车速信号

No.	Signal Name	Signal Description	Size	Note
1	VehicleSpd	Current Vehicle speed information (when v < 1 kph, set value to 0.) refer to "Veh speed cal" tab for detail.	3	
2	VehicleSpdValid	Quality/fault information to current Vehicle speed information. Refer to the "Veh speed cal" tab for detail.	1	

3.2 SAS


APA 接收 SAS 发出的方向盘转角信号、SAS 工作状态信号。

No.	Signal Name	Signal Description	Size	Note
1	SteeringWheelAngle	angle of steering wheel (raw data)	15	合并成一个带符号数也可以
2	SteeringWheelAngleSign	sign of steering wheel angle (+/-) definition according to DIN 70000 / ISO 8855. wheel to left = positive; wheel to right = negative. straightforward = 0 (positive)	1	
3	SteeringWheelSpeed	steering wheel rotation speed (raw data)	15	合并成一个带符号数也可以
4	SteeringWheelSpeedSign	sign of steering wheel speed (+/-) definition according to DIN 70000 / ISO 8855 wheel to left = positive; wheel to right = negative wheel straightforward = 0 (positive)	1	
5	SAS_Status	status of steering angle sensor (used in combination with class 3 sensor)	2	

3.3 ABM

APA 接收 ABM 发出的加速度信号（补偿计算车辆的位置信息）。

No.	Signal Name	Signal Description	Size	Note
1	LongitudeAcc	Longitude acceleration	16	
2	LateralAcce	Indicates Lateral Acceleration	16	
3	VehDynYawRate	Vehicle yaw rate	16	
4	LongitudeAccValid	Longitude acceleration valid	1	
5	LateralAcceValid	Indicates Lateral Signal State	1	
6	VehDynYawRateValid	Vehicle yaw rate valid	1	

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3.4 EPS

APA 接收 EPS 发出的驾驶员干预信号、EPS 工作状态信号。

EPS 接收 APA 发出的控制信号、APA 工作状态信号

3.4.1 APA 接收 EPS 发出的驾驶员干预信号、EPS 工作状态信号

No.	Signal Name	Signal Description	Size	Note
1	EPS_InterferDect	Driver Steering Interference Detected	1	
2	EPS_InterferDectValid	Driver Steering Interference Detected Validity	1	
3	EPS_AvailSts	Electrical Power Steering Available Status	2	

3.4.2 EPS 接收 APA 发出的控制信号、APA 工作状态信号

No.	Signal Name	Signal Description	Size	Note
1	APA_WorkSts	Advanced Parking Assist Status	2	
2	APA_ReqEPSTargetAngle	Steering Wheel Angle Request: Target Angle	16	
3	APA_ReqControlEPSValid	Steering Wheel Angle Request: Request Control EPS Validity	1	
4	APA_ReqControlEPS	Steering Wheel Angle Request: Request Control EPS	1	

3.4.3 APA 与 EPS 的通信



CHB041-Communication between APA a

3.4.3 APA 对 EPS 的要求




TTE APA System
Performance Requi

3.5 TCU

APA 接收 TCU 发出的档位信号。

No.	Signal Name	Signal Description	Size	Note
1	TGS_LEVER	Transmission gear selector lever position	16	

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3.6 IPC

IPC 接收 APA 发出的声音信号、APA 泊车引导信号。

No.	Signal Name	Signal Description	Size
1	FPAS_WorkSts	Park Assistant Front System Status	2
2	FPAS_SoundIndication	Front Park Assistant System Sound Indication	3
3	RPAS_WorkSts	Park Assistant Rear System Status	2
4	RPAS_SoundIndication	Rear Park Assistant System Sound Indication	3
5	APA_InfoDisplayReq	Advanced Parking Information display request	8
6	APA_WorkSts	Advanced Parking Assist Status	2
7	APA_SysSoundIndication	APA System Sound Indication	4
8	APA_ParkBarFillDirection	APA(Advanced Parking Assist) Parking progress bar fill direction	1
9	APA_ParkBarPercent	APA(Advanced Parking Assist) Parking progress percentage bar	7



半自动泊车辅助泊车信息提示.doc

3.7 AVM/HUT


AVM/HUT 接收 APA 发出的探测距离信号、工作状态信号。

No.	Signal Name	Signal Description	Size	Note
1	PAS_ObjectSts_FLC	Park Assistant Front Left Corner Object Status	4	
2	PAS_ObjectSts_FLM	Park Assistant Front Left Middle Object Status	4	
3	PAS_ObjectSts_FRM	Park Assistant Front Right Middle Object Status	4	
4	PAS_ObjectSts_FRC	Park Assistant Front Right Corner Object Status	4	
5	PAS_ObjectSts_RLC	Park Assistant Rear Left Corner Object Status	4	
6	PAS_ObjectSts_RLM	Park Assistant Rear Left Middle Object Status	4	
7	PAS_ObjectSts_RRM	Park Assistant Rear Right Middle Object Status	4	
8	PAS_ObjectSts_RRC	Park Assistant Rear Right Corner Object Status	4	
9	FPAS_WorkSts	Park Assistant Front System Status	2	
10	RPAS_WorkSts	Park Assistant Rear System Status	2	

3.8 AC-FCP

APA 接收 AC-FCP 发出的温度信号。

No.	Signal Name	Signal Description	Size	Note
1	CdngAmbTemp	Air Conditioning Ambient Temperature	8	温度补偿计算

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3.9 Trailer

APA 接收 Trailer (GWA) 发出的拖车信号。

No.	Signal Name	Signal Description	Size	Note
1	TrailerSts	Trailer Status	1	拖车时关闭 RPAS

3.10 BCM


APA 接收 BCM 发出的拖车信号。

No.	Signal Name	Signal Description	Size	Note
1	TrunkSts	Trunk status	1	后背门开启时关闭 RPAS
2	LeftTurnSWSts	Left turn switch status	1	APA 泊车方向选择
3	RightTurnSWSts	Right turn switch status	1	APA 泊车方向选择
4	APASwCmd	APA switch command.	1	APA 开关
5	APASwErrSts	APA switch error status.	1	APA 开关
6	HeadLampWashCmd	Head lamp washer command	1	前大灯清洗时对 FPAS 补偿
7	PASSwSts	Radar switch status	1	PAS 开关 (没用, 改 BCM 控制)
8	PASSwErrSts	Radar switch Error status	1	PAS 开关 (没用, 改 BCM 控制)
9	PASWorkCmd	PAS Work command	1	PAS 功能开关 (BCM 控制逻辑)

4 其他

4.1 CheckSum 和 RollingCounter

参照 XXX 标准执行

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